ORIGINAL

0000104076

BEFORE THE ARIZONA POWER PLANT

AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF STARWOOD SOLAR I, L.L.C., IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES, SECTIONS 40-360, et seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF A 290 TO 365 MEGAWATT SOLAR THERMAL POWER PROJECT AND A 500KV TRANSMISSION LINE ORIGINATING AT THE PLANNED STARWOOD SOLAR I SUBSTATION TO THE PLANNED AND PERMITTED DELANY SUBSTATION AND INCLUDING A 500KV TRANSMISSION LINE FROM THE PROPOSED STARWOOD SOLAR I SUBSTATION TO THE EXISTING HARQUAHALA GENERATING STATION SWITCHYARD IN MARICOPA COUNTY, ARIZONA.

Docket No. L-00000MM-09-0446-00150

Case No. 150

NOTICE OF FILING APLICANT'S DIRECT TESTIMONY

NOTICE IS HEREBY GIVEN that the Applicant, Starwood Solar I, L.L.C. is filing the Direct Testimony of (1) Brad Nordholm; (2) Richard Weiss; (3) Jennifer Frownfelter; (4) Richard Henry; and (5) Jerry Smith.

DATED this 20th day of October, 2009.

JENNINGS, STROUSS & SALMON, P.L.C.

By _____
Kenneth C. Sundlof, Jr.
The Collier Center, 11th Floor
201 East Washington Street
Phoenix, Arizona 85004-2385
Attorneys for Starwood Solar I, L.L.C.

ORIGINAL and 25 copies filed this 20th day of October, 2009, with:

Docket Control
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007

COPIES of the foregoing sent via Federal Express to the Committee Members this 20th day of October, 2009

By Michelle Hasser

BEFORE THE ARIZONA POWER PLANT

AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF STARWOOD SOLAR I, L.L.C., IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES, SECTIONS 40-360, et seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF A 290 TO 365 MEGAWATT SOLAR THERMAL POWER PROJECT AND A 500KV TRANSMISSION LINE ORIGINATING AT THE PLANNED STARWOOD SOLAR I SUBSTATION TO THE PLANNED AND PERMITTED DELANY SUBSTATION AND INCLUDING A 500KV TRANSMISSION LINE FROM THE PROPOSED STARWOOD SOLAR I SUBSTATION TO THE EXISTING HARQUAHALA GENERATING STATION SWITCHYARD IN MARICOPA COUNTY, ARIZONA.	Docket No. L-00000MM-09-0446-00150 Case No. 150

DIRECT TESTIMONY OF BRAD NORDHOLM

ON BEHALF OF STARWOOD SOLAR I, L.L.C.

STW-008

Q. Mr. Nordholm, you are the CEO of Starwood Energy Group?

A. I am the Chief Executive Officer and Managing Director of Starwood Energy Group Global LLC, which is the 100% owner of the applicant Starwood Solar I, LLC.

Q. Mr. Nordholm, what are you doing in Arizona?

A. I guess the immediate answer is that I am here to address the Siting Committee. But, the real answer is that Starwood Energy has a high level of interest in developing renewable power projects in Arizona. Solar power is an important part of the future of the electric power industry. At Starwood, we feel that the application of our significant expertise in power plant development into solar power development in Arizona is a logical extension of our business.

Arizona is the natural place for solar to develop. Arizona is being referred to as the "Persian Gulf of Solar". And that makes sense. Arizona has the sunshine, the infrastructure, the people and the desire to become the major player in this industry.

Q. Please describe your professional background.

A. I have developed or acquired, and then managed equity investments in power generation, gas storage and other energy projects with equity investments in excess of $1 billion and enterprise value in excess of $3 billion.

Prior to joining Starwood Energy, I was Co-Founder and CEO of Tyr Energy, Inc, an award-winning energy asset management firm that managed in excess of $3.5 billion of generation assets, and Chairman of Tyr Capital, LLC, an

investment fund that acquired power generation assets. Previously, I was Senior Vice President and General Manager, Capacity Services Division, Aquila, Inc where I was responsible for the development, acquisition, management and daily optimization of 3,800 MW of power generation, 18 Bcf of gas storage and 12 Bcf/day of gas transportation assets.

I received my B.A. in Economics from Carleton College in 1978 and completed the Harvard Business School PMD program in 1989. I currently serve as a director on numerous portfolio companies and of the Kansas City Life Insurance Company (NASDAQ: "KCLI"), I am a frequent speaker at industry meetings. My educational and professional background is set forth in Exhibit STW-009.

Q. Mr. Nordholm, would you introduce Starwood Energy to the Committee.

A. Starwood Energy is an affiliate of Starwood Capital Group Global, L.L.C. It is a private equity investment firm based in Greenwich, Connecticut, that specializes in energy infrastructure investments. Founded in 2005, Starwood Energy has committed to seven transactions representing nearly $4.9 billion in enterprise value and has developed a deep pipeline of power/energy investment opportunities. The investment approach of Starwood Energy parallels Starwood Capital Group's successful strategy in real estate—a focus on locational supply and demand and replacement cost. Since its inception in 1991, Starwood Capital and its predecessors have invested approximately $5.4 billion of equity capital in over 300 transactions representing $20 billion in enterprise value.

Q. You mentioned Starwood Capital. Is that the hotel company?

A. Starwood Capital is well known for its 1995 acquisition and subsequent recapitalization, reorganization and expansion of Starwood Hotels & Resorts Worldwide, Inc. (NYSE: HOT "Starwood Hotels"), a Fortune 500 company, with ownership of brands such as Westin, Sheraton, W Hotels, The St. Regis, Le Meridien, The Luxury Collection and Four Points by Sheraton. I believe you are referring to Starwood Hotels and Resorts. Starwood Capital created and then took public Starwood Hotels and Resorts in the mid-90s. Today it is a completely independent company. Our Chairman, Barry Sternlicht, licenses to them, the "Starwood" name.

Starwood Capital's roots are in the real estate markets, but its investment discipline applies across all investment classes. Emphasizing risk and return, Starwood Capital has changed its investment focus across all asset classes, geographic regions (not only in the United States but around the world) and different parts of the capital structure. Starwood has always strived to achieve the best risk adjusted return.

Q. Where does Starwood Capital get its money?

A. Investors in the Starwood Capital and Starwood Energy funds include many leading public and private retirement programs, university endowments, foundations, banks, insurance companies and high net worth investors.

Q. Can you provide some examples of the work of Starwood Energy and Starwood Capital in the energy and renewables industry?

A. Yes, I will provide a summary of some of the activities of Starwood and its subsidiaries and partnerships, relating to energy.

NAUTILUS ENERGY, LLC

Nautilus Solar Energy is a leading solar power generation developer headquartered in Chatham, New Jersey. Nautilus Solar develops, constructs, finances, owns, and operates distributed generation and utility-scale solar electric systems. Since 2006, Nautilus Solar has eight completed solar retail projects in operation, four projects under construction, and a project pipeline of over 500 MWs of solar generating capacity over the next two years. The acquisition of a majority interest in Nautilus Solar, along with the 2007 teaming arrangement with Lockheed Martin to pursue utility-scale solar development opportunities, will significantly expand Starwood Energy's solar energy platform and market growth strategy.

NEPTUNE REGIONAL TRANSMISSION SYSTEM, LLC

Neptune is a 53-mile, 660 MW high voltage direct current transmission system that interconnects the Long Island Power Authority ("LIPA") with the PJM regional transmission organization in Sayreville, NJ. At the conclusion of a competitive process, Neptune was awarded a 20-year Firm Transmission Capacity Purchase Agreement by LIPA to provide 660 MW of firm transmission capacity. Construction was completed in June 2007 on schedule and within budget. Thereafter, the line was successfully energized and commenced commercial operations in July 2007. Neptune won the prestigious North American Infrastructure Deal of the Year 2005 Award by Project Finance, a Euromoney publication. Neptune provides about 20% of the Long Island power needs and generates stable, contracted cash flows for its owners.

CALPEAK POWER, LLC

CalPeak is a portfolio of five simple-cycle, natural gas-fired peaking projects, totaling 260 MW of capacity, located in California. The plants are fully contracted to Pacific Gas & Electric and San Diego Gas & Electric via back-to-back agreements with the California Department of Water Resources. Given the growth in intermittent sources of renewal generation in California, these facilities represent an increasingly important source of reliability and load balancing. The contracted nature of the assets provides reliable cash flows for its owners. Starwood Energy acquired the plants from United Technologies Corporation in May 2006. Calpeak acquisition financing won the North American Portfolio Financing Deal of the Year 2006 by Project Finance, a Euromoney publication.

MIDWAY PROJECT

Midway is a 120 MW simple-cycle peaking plant located 60 miles west of Fresno, California that was developed by Starwood beginning in 2006 and successfully placed into commercial operation in May, 2009. The project economics are supported by a 15-year Power Purchase Agreement from Pacific Gas & Electric and the project was built by a subsidiary of Pratt & Whitney, a division of United Technologies Corporation, under a full-wrap EPC contract. The project provides fast-response energy in support of intermittent renewable generation and other reliability issues in the capacity constrained California market.

THERMO - FT. LUPON PROJECT

Thermo Ft. Lupton Facility is a 272 MW combined cycle power plant and associated greenhouse steam-host located approximately 25 miles northeast of Denver, Colorado. The project is fully contracted through June 30, 2019 via tolling agreements with Public Service of Colorado and Tri-State Generation and Transmission Association. Thermo is a key resource for Colorado because it serves as "spinning reserve" capacity which can be brought online quickly to meet fluctuations in power supply and demand.

MEAD TRANSMISSION LINES

The Mead-Phoenix project is a 1,296 MW, 500 kV AC transmission line extending 202 miles from southern Nevada to southern California, and the Mead-Adelanto project is a 1,300 MW, 500 kV AC transmission line that extends 256 miles from the southern Arizona to central Arizona. Starwood Energy owns a minority interest in these transmission lines which it acquired from the City of Vernon.

HUDSON TRANSMISSION PROJECT

Hudson is a 660 MW, 345 kilovolt transmission line that will be built between Ridgefield, NJ and midtown Manhattan. The Hudson-sponsored project will include approximately eight miles of buried transmission cable, four miles of which will be installed beneath the Hudson River, and a converter station in Ridgefield that will convert alternating current ("AC") power into direct current ("DC") power for purposes of efficient transmission, and back to AC power for distribution to the New York Power Authority's ("NYPA") New York City customers. The Hudson project was selected in 2006 by NYPA at the conclusion of an RFP process for new capacity for New York City Hudson will help NYPA meet reliability standards for New York City, while establishing a link to electricity markets in the PJM Interconnection, the regional transmission organization that coordinates electric utilities and power producers in 12 states stretching from Pennsylvania to North Carolina and westward to Illinois. The line is expected to begin construction in 2010 and be completed in 2012.

GREEN LINE PROJECT

The Green Line Project is a 660 MW undersea transmission cable currently under development that will stretch from Maine to Boston, Massachusetts. The project will not only ease tight capacity constraints in the Boston but will also serve as a vehicle for transmitting green energy, particularly from new wind capacity, currently being built in Maine. The project employs the same

technology as the Neptune project, and the development team is substantially the same. Starwood Energy anticipates project completion by 2013.

Q. The application also mentions the involvement of Lockheed Martin Corporation. Can you please describe Lockheed Martin?

A. Headquartered in Bethesda, MD, Lockheed Martin is a global security company that employs about 146,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The corporation reported 2008 sales of $42.7 billion. As a global security and information technology company, the majority of Lockheed Martin's business is with the U.S. Department of Defense and the U.S. federal government agencies. In fact, Lockheed Martin is the largest provider of IT services, systems integration, and training to the U.S. Government. The remaining portion of Lockheed Martin's business is comprised of international government and commercial sales of products, services and platforms.

Q. Please describe Lockheed Martin's role in this project.

A. It is anticipated that Lockheed Martin will be the engineering, procurement and construction (EPC) contractor for this project.

Q. Mr. Nordholm, Starwood announced in June of this year that it had negotiated a thirty year power purchase agreement with APS for the entire output of the proposed generating facility. Is that still the case?

A. No, Starwood was forced to provide notice of termination of that contract to APS on September 29, 2009.

Q. Why, what happened?

A. My answer here is involved, and gets into the challenges and difficulties of financing and constructing a large solar power plant. The short answer is that Lockheed Martin was unable to enter into the EPC for the project because it was uncomfortable with the overall level of risk under the EPC.

Q. Then, is Lockheed Martin still involved?

A. Yes. Lockheed Martin has expended considerable effort on this project, and continues to do so. The goal is to proceed in a manner that reduces risks.

Q. What does that mean?

A. Well, an easy approach to reducing risk is simply to reduce the size of the overall project. That is why we are proposing to break the project into two parts, or two phases. Each will be 145 MW, rather than one project of 290 MW. This small change is a major change to the projects risk profile and feasibility.

Q. Can you elaborate on financing a project of this size?

A. There is a reason that we, as power developers, are not seeing a proliferation of large solar generating facilities. A large project such as this one presents a number of risks to the investor, some of which are unique to this type of project and some of which are present in any large scale generation project. A plant of this scale has never been built. While the technology is proven, still the scale presents risks, which must be taken into account by investors. Layer on that the standard risks of construction, financing, and counterparty performance, and we are presented with a difficult risk profile.

Q. Is this a challenge that can be overcome?

A. Yes, we would not be here unless we were very certain that the Starwood has the financial strength and expertise to build this project. We are asking the Committee to be understanding of the challenges, and permit this plant on the basis that Starwood will continue to work with utilities to permit this project to be built.

Q. Can you elaborate on some of the other risks?

A. Yes, one is the supply chain risk. For example the molten salt storage systems are unique to this type of facility. There are few sources of the specialized salt materials and few options on manufacturing the complicated holding vessels. It takes a company that is experienced in international procurement and the integration of large systems to assume the supply side risk associated with this system.

Another is the manufacture and fabrication of the solar receivers It is difficult to imagine hundreds and even thousands of acres of finely tuned parabolic mirrors. Each must be manufactured and installed to exacting specifications. Each must be constructed and configured to extract the maximum energy from the sun.

Yet another is the issue of the overall project coordination. There is no room for error here. To make solar viable requires execution of project planning, engineering and construction, to exacting specifications.

Starwood and its partners bring to the table the total expertise to do this project right, and to make the project happen.

Q. What is the overall objective of Starwood?

A. To build solar power projects that balance the risk and costs to achieve a acceptable result for our companies and the power purchaser.

Q. And is Starwood positioned to do that?

A. Absolutely. We expect setbacks along the way. The cancellation of the APS contract is a major setback. But, we have a strong project team who is committed to doing those things necessary to bring this project to fruition. The need is there, and Starwood is positioned to meet the need. We have 4 other solar projects located in different regions in the US in advanced development.

Q. You mentioned need, what is the need for the output of this generating facility?

A. The market, and hence the need, is huge. All regional utilities are faced with requirements to expand their renewable energy portfolios. The plants ready for construction are not out there to meet this need. We see announcements regularly, but have yet to see a shovelful of dirt turned. Starwood is positioned to meet the need. Starwood presents a strong team that will accomplish the objective, and meet the pressing need for reliable renewable energy.

Q. Can you elaborate for the three major Arizona electric utilities?

A. Yes, the three major electric utilities in Arizona are Arizona Public Service, Tucson Electric Power, and the Salt River Project. Both APS and TEP have future renewable portfolio standards that have been promulgated by the Corporation Commission. SRP has a requirement adopted by its own board.

Starwood Energy is positioned to be a part of the solution for the Arizona utilities, and derivately, for the people of Arizona.

Q. Is Starwood Energy committed to this project?

A. Tens of millions of dollars have already been spent on this project for engineering, permitting, land assemblage, interconnection and other studies. Starwood Energy is very serious about this project and about providing solar energy to Arizona. Starwood Energy intends be a part of a long and prosperous partnership with the people of the State of Arizona.

Q. I have no further questions.

###

BEFORE THE ARIZONA POWER PLANT

AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF STARWOOD SOLAR I, L.L.C., IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES, SECTIONS 40-360, et seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF A 290 TO 365 MEGAWATT SOLAR THERMAL POWER PROJECT AND A 500KV TRANSMISSION LINE ORIGINATING AT THE PLANNED STARWOOD SOLAR I SUBSTATION TO THE PLANNED AND PERMITTED DELANY SUBSTATION AND INCLUDING A 500KV TRANSMISSION LINE FROM THE PROPOSED STARWOOD SOLAR I SUBSTATION TO THE EXISTING HARQUAHALA GENERATING STATION SWITCHYARD IN MARICOPA COUNTY, ARIZONA.	Docket No. L-00000MM-09-0446-00150 Case No. 150

DIRECT TESTIMONY OF RICHARD WEISS

ON BEHALF OF STARWOOD SOLAR I, L.L.C.

STW-010

Q. Please state your name and professional background.

A. My name is Richard Weiss and my experience has included executive positions with power and energy companies having responsibility for building and managing organizations engaged in O&M, engineering and construction, and asset management. I am currently a Partner of Optimal Results, L.L.C., which is a Houston based consulting firm of experienced industry professionals who support the fossil and renewable power industry. For the past 4 years Optimal Results has advised the Starwood Energy Group with respect to project management, project development, asset valuation, contractual arrangements, operating costs, and acquisitions. We have been successful in acquiring a number of power plants, 5 in California and 1 in Colorado and have fully developed and in May of this year commissioned a 120MW gas turbine plant in Fresno. STW-011 is a copy of my professional resume.

Q. What is your role with respect to the project that is presented in this application?

A. I am the project manager. This means I manage the projects various contracts with landowners and service providers, manage the permitting activities, budget, financing, and schedule. I am successful when the project achieves commercial operation while in compliance with its contracts, permits, schedule, and financial objectives. In other words, "on time and under budget".

Q. Please describe the applicant, Starwood Solar I.

A. Starwood Solar I is a special purpose limited liability company. It is wholly owned by Starwood Energy Group Global, LLC. Mr. Nordholm described Starwood Energy in his testimony.

Q. What is Starwood Solar I's role in this project?

A. Starwood Solar I will own and manage the project, contribute equity, arrange for third party debt, acquire necessary permits, manage the EPC contractor and plant operator, and comply with third party obligations, permits and government approvals.

Q. The application also mentions Lockheed Martin Corporation. Can you describe Lockheed Martin and explain its role in this project

A. Mr. Nordholm in his testimony described Lockheed Martin. We anticipate that Lockheed Martin will design, construct, and operate the project as the EPC contractor that is engineer, procure and construct the plant on a fixed price basis.

Q. In summary format please describe the project that is presented in this application.

A. The Starwood Solar I project is a 290MW utility scale solar generation facility; the operation of such a facility is graphically depicted on Exhibit STW-012. The generation facility converts the sun's energy into heat using a field of sun-tracking parabolic mirrors. The sun's energy is reflected off the mirrors and collected in Receiver Tubes which in turn transfers the thermal energy to a High Temperature Fluid (HTF) system. The collected thermal energy is used to power steam turbine generators, which produce electricity. The facility will

also have the ability to store heat through a molten salt storage system, which allows the facility to produce energy when the sun is not shining. The facility will include a 500 kV transmission line to interconnect with the transmission system at the site of the Delany substation. Starwood Solar I is requesting the flexibility to construct the project in two phases, each producing 145 MW.

Q. Where will the power from this facility go?

A. The output of this facility will be used to meet the energy and renewable portfolio requirements of regional utilities.

Q. Where will the facility be located?

A. The facility will be located on three sections of land in the Harquahala Valley that is currently used for agricultural purposes. The overall site is approximately 1920 acres. The three sections of land are located at the theoretical intersection of 491st Avenue and Indian School Road, in Maricopa County. Exhibit SWT-013 is an aerial map of the project location, including the transmission line alternatives. This also is shown on the placemat.

Q. What will the facility look like?

A. Exhibit STW-014 is a rendering of the appearance of the facility from the air. As you can see the dominant feature of the facility is the acres of parabolic mirrors that form the energy source for the project. As you can see the three sections form an L shape. At the central portion of the L is the power block, which consists of the steam turbines and cooling towers, evaporation ponds, the salt storage system and the project switchyard.

Q. When do you expect construction to occur?

A. Starwood Solar I currently anticipates that construction of the first phase of the generating station will begin in mid-2010. The first phase will also include the transmission to Delany. Commercial operation is scheduled for the end of 2013. The second phase of the generation will begin in 2013 for an in service date of 2016. The link to the Harquahala substation will be built when needed, but no later than the end of 2016. For this reason Starwood Solar I is requesting a CEC with a seven year term.

Q. Mr. Weiss, I would like for you to describe the configuration and operation of the facility in more detail. Would you begin by describing the mirrors?

A. The 290MW project will include approximately 3500 parabolic mirrors. Exhibit STW-015 is a representative photograph of one of the mirrors. Each mirror will be approximately 300 feet long and 14 feet wide, and of course will be parabolic in shape to best focus the energy of the sun onto the Receiver Tubes. The mirrors will be constructed of highly reflective mirrors of thick glass mounted on precisely aligned aluminum space frames. The mirrors will be aligned in a north to south configuration. Each mirror will include a mechanism to track the movement of the sun across the sky, again to best capture the sun's energy. A demonstration project of this nature has been developed at APS' Saguaro Power Plant. A photograph taken from that facility provided as Exhibit STW-016 shows the mirror appearance and scale.

Q. Please describe how the mirrors capture the sun's energy.

A. The parabolic mirrors are designed so that the sun's energy is focused on Receiver Tubes that run the length of the mirror. This is shown in Exhibit

STW-017. The Receivers are steel tubes that are encased in glass. The area between the tube and glass is under a vacuum to minimize heat loss. The tubes have an external coating to improve energy absorption. Inside these tubes is an oil based fluid, which is the heat transfer medium. This fluid is called the heat transfer fluid. This configuration produces tremendous heat, allowing the heat transfer fluid to reach temperatures in excess of 730 degrees Fahrenheit.

Q. What happens with the heated fluid?

A. The heated fluid is pumped to the power block area in a closed loop system to perform two functions, depending upon need. The first function is to produce steam through a heat exchanger. This steam is used to power conventional steam turbine generators. The second function is to heat tanks full of molten salt, in order to store thermal energy to be used when needed. Exhibit STW-018 is a diagram of the movement of the heat transfer fluid.

Q. Please describe the molten salt storage system.

A. As shown on STW-018 salt will be stored in a number of paired hot and cold large tanks adjacent to the power block. The overall volume of the salt will be between 40,000 and 160,000 tons, depending on the ultimate salt storage configuration. Salt reaches a molten state at approximately 530 degrees Fahrenheit. At start up the salt will be heated by natural gas burners to reach a temperature of approximately 568 degrees Fahrenheit. Then, energy from the sun, captured by the mirrors and the fluid, will continue to heat the salt maintaining a temperature of 568 degrees Fahrenheit. As you can see by STW-xxx, the salt storage tanks will be interconnected to the heat exchangers, to produce steam to run the steam turbines. In times of very cold and cloudy

weather, it may be necessary to use natural gas to maintain the salt in a molten state. The residual heat of the salt system will last for about 3-5 days. If there is no sun available for that period natural gas will be needed to keep the salt in a molten state.

Q. Is this ordinary table salt?

A. No, it is a special blend of NaNO3 and KNO3. This is a very high purity salt and is only produced by two manufacturers worldwide. One is in Chile and the other in Israel.

Q. Please describe the steam turbines.

A. The construction will be phased in two parts. Each part will involve the construction of infrastructure to power a conventional steam turbine having a nominal capacity of 145 MW. The two phases together will produce a nominal output of 290 MW.

Q. Please describe the heat exchangers.

A. In concept, these are much like a boiler found in any power plant. The heat exchange fluid, whether heated by the sun or from the molten salt, produces steam in a closed cycle heat exchanger system, which powers the turbines.

Q. How is the steam cooled?

A. Again, as with a conventional power plant, the exhaust of the steam turbine is cooled through the use of wet cooling towers. As you can see on STW-018 the project anticipates 8 to 10 cooling towers which reject heat through evaporation.

Q. Please describe the water use of these cooling towers.

A. It is anticipated that the water use will be no more than 3,000 acre feet per year and probably significantly less. The plant is modeled for a total annual water use of 2,313 of which 97% is cooling and the remainder is used for mirror washing and other site uses. The water will be re-cycled multiple times, and then it will be evaporated in lined evaporation ponds.

Q. Where will the project obtain the water?

A. The project will use groundwater pumped from new on site wells. Currently the land is irrigated by existing wells on the property. Most of those wells will be capped, and replaced by the new wells.

Q. Is there any other use of water on the property?

A. As mentioned, regular use of water will also include mirror washing, which will be done on a periodic basis, and steam system blowdown. There is also some minor water use for domestic and fire protection purposes.

Q. What is the anticipated total water use?

A. As mentioned, it is estimated that the total use of groundwater will be approximately 2,313 acre feet per year. To be safe and to account for weather and equipment variations, we have modeled the use of 3,000 acre feet per year.

Q. How does this compare with the current water use on the property?

A. Currently the acreage is in agricultural production. The total water use for the three sections in cultivation is estimated to average around 7,100 acre-feet per year. This water use is a combination of groundwater and Central Arizona

Project (CAP) water, with groundwater use averaging approximately 2,600 acre feet per year. Specific details of the water use and potential impacts on the aquifer have been analyzed by URS Corporation and submitted as Exhibit STW-040.

Q. Mr. Weiss, would it be possible to use less water in this facility?

A. As with any steam turbine power plant, it is possible to employ dry cooling. But, as has been explained in many cases before this Committee, dry cooling comes with significant disadvantages of lower output and higher costs. With a solar power plant in particular, it is very important to provide output at the lowest possible cost. It is estimated that dry cooling will cut output by 2 to 5 percent and increase costs up to 12.5 percent and increase parasitic load by 3 percent. A dry cooling requirement would impose such significant capital costs on the project as add stress to the project so as to make it non-competitive. It is estimated that a dry cooling requirement would add nine percent to the price of the output.

Starwood Solar knows that water use is important. But, water is needed to bring a solar power plant to fruition. It is for that reason that Starwood Solar is locating on land that is already using more water then we require. The overall impact of the development is to save water on this site.

Q. What about solar photovoltaic?

A. The cost of solar photovoltaic continues to come down, and it certainly has a place in the generation mix, but is currently more costly than concentrated solar. The major problem with photovoltaic is that it does not produce heat, only electricity. This attribute eliminates storage capabilities, meaning that the

plant produces on capacity, only energy. The electrical production from a PV plant is more akin to wind generation. Power is only produced when the suns shines and responds to even mild cloud cover which makes the production profile very erratic. In order to meet the peak load characteristics of any utility system, the most effective solar system using today's technology is the thermal solar configuration that Starwood Solar I proposes.

Q. Mr. Weiss, please describe the performance characteristics of the generating facility.

A. It is estimated that the facility will produce approximately 930 gigawatt hours per year. The profile of electrical output matches typical utility peak load profiles in that we produce maximum output during the peak periods, mid day and have a steady controllable output. If needed we can turn the plant down and store energy of if clouds cover the site can run off of stored energy. The salt storage can be used to start the plant before the sun rises or continue operations after the sun has set.

Q. Describe the capacity factor of this generating facility.

A. Capacity factor is the number of hours of actual production compared to total production hours. The capacity factor of this generating facility will be between 37 and 39.

Q. *Mr. Weiss, explain why Starwood Solar chose this particular location.*

A. There are a number of reasons, some of which are self evident from my testimony. First, and importantly, this is an area of strong sunshine and little dust and air pollution. Second, the site is close to existing transmission and a permitted switchyard and presents one of the best options for delivering power

to the grid. Third, the site is existing agriculture with strong groundwater resources, and already disturbed land. The overall impact of the project will be a net reduction in water use. Fourth, the area is sparsely populated; the project will have minimum impact on existing residences and structures. And, finally, the land is available in large blocks.

Q. Please describe the transmission for the project.

A. The output from the steam turbines will be stepped up from 13.8 kV to 500 KV at the project switchyard. It will then be transmitted over a single circuit 500 kV line to the area of the permitted by not yet built Delany switchyard, which is a distance of approximately 4 miles. This is the delivery point of Starwood Solar I's interconnection request with APS. APS will then build transmission, which is already permitted, to the Palo Verde bus.

Starwood Solar also seeks a permit for a short segment of a 500 kV transmission line from the power block south to the area of the existing Harquahala power plant. This will facilitate a possible future interconnection loop and improve the stability and reliability for the high voltage network in the area.

Q. What type of transmission structures does Starwood Solar propose?

A. The structures will be single circuit monopoles. STW-019 is a graphical representation of a typical structure. The nominal height will be approximately 150 feet.

Q. What are the routing options?

A. Exhibit STW-020 shows the location of the Starwood Facility, the location of the Delany switchyard, and the location of the Harquahala power plant. As you can see Starwood proposes three alternate routes, one follows an Indian School Road alignment and the second follows an alignment following the half section line South of Indian School. The third is a sub-option to follow the Salome highway or the section line into the Delany substation.

Q. You mention Indian School Road. Is there an Indian School Road in this area?

A. No there is no road. This designation is just a theoretical extension of Indian School Road. Same with the Thomas Road alignment.

Q. But, there is a Salome highway.

A. Yes, that is an actual dirt road.

Q. What is your preferred alternative?

A. Our preferred alignment is the Indian School to Salome Highway alignment. While there is not much development in the area now, we feel that this alignment presents the least interference with possible future alignments, as it follows an existing section line and a portion of an existing highway.

Q. What corridor width are you requesting?

A. We are requesting a nominal corridor width of 1,000 feet to give us maximum flexibility to properly locate the facilities and work with the landowners. The requested corridors are shown on Exhibit STW-021.

Q. Why did you not choose Thomas Road as an alignment?

A. There is an existing 500 kV line along the Thomas Road alignment. This line interconnects the Harquahala Power Plant to the Hassayampa area. This might seem like a logical corridor because of the existing line. But, as will be explained in the testimony of Jerry Smith, a co-location of two 500 kV lines in a single corridor is not encouraged under Western Electricity Coordinating Council guidelines. Because of a need to avoid a common corridor, Starwood did not include Thomas Road as an alternative.

Q. You mentioned the plan to interconnect to the APS Delany switchyard. Is there currently a Delany switchyard?

A. The Delany switchyard was permitted in Case No. 128. That case also permitted a 500 kV line from Delany to Palo Verde (or as an alternative, the Arlington switchyard). Neither the switchyard nor the line from Delany to Palo Verde is built. We have discussed the timing of the connection with APS. APS agreed that the facilities to connect Starwood Solar I to Palo Verde will be built to be ready for the Starwood Solar I interconnection. This could mean just the line, or it could mean the line and switchyard, depending on other potential interconnectors.

Q. What is the approximate cost of the generating facility?

A. Including land costs, the generation facility will cost approximately $1.7 to $2.0 billion.

Q. What is the approximate cost of the transmission?

A. The transmission cost, including right of way, is estimated at $11.0 to $12.2 million. The segment to Harquahala would cost an additional $2.5 million.

Q. Then what is the total project cost?

A. Total project cost is estimated at $2.0 billion.

Q. Please describe the economic impact of this project.

A. In connection with this project Lockheed Martin retained the firm of Hickey & Associates, a site selection and management consulting firm headquartered in Minneapolis, Minnesota, to perform an independent analysis of the economic impact of the Starwood Solar I project on the State of Arizona and Maricopa County. The economic impact relates to the total new and continued capital circulation (money) and jobs created.

In summary it is estimated that during the period from 2010 to 2013 the project will invest approximately $2 billion in capital and create an estimated 950 construction jobs, 50 engineering jobs and 75 plant operating jobs. For the purpose of this analysis a conservative estimate of $1.3 billion in capital investment is used to determine the economic impact. Based on this information, the potential project will have the following total economic impact from 2010 to 2013 as follows:

- The estimated total peak job impact is 7,724.
- The total money impact is $2.7 billion.
- The total tax impact, not counting the tax from power sales, is $29.9 million.

The study concludes that preliminary economic impact analysis clearly indicates a significant positive impact by the Starwood Solar I project on Maricopa County and the State of Arizona.

Q. Finally, Mr. Weiss we have mentioned that this generating facility will be fueled entirely from solar energy. Lest this point gets lost in the detail, *can you explain what this means for the environment?*

A. What could be cleaner than energy from the sun? It is estimated that this generation facility will eliminate 490,000 tons per year of carbon emissions. The impact is to remove a 290MW fossil fuel fired GTCC from service.

Q. I have no further questions.

###

BEFORE THE ARIZONA POWER PLANT

AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF STARWOOD SOLAR I, L.L.C., IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES, SECTIONS 40-360, et seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF A 290 TO 365 MEGAWATT SOLAR THERMAL POWER PROJECT AND A 500KV TRANSMISSION LINE ORIGINATING AT THE PLANNED STARWOOD SOLAR I SUBSTATION TO THE PLANNED AND PERMITTED DELANY SUBSTATION AND INCLUDING A 500KV TRANSMISSION LINE FROM THE PROPOSED STARWOOD SOLAR I SUBSTATION TO THE EXISTING HARQUAHALA GENERATING STATION SWITCHYARD IN MARICOPA COUNTY, ARIZONA.	Docket No. L-00000MM-09-0446-00150 Case No. 150

DIRECT TESTIMONY OF JENNIFER FROWNFELTER

ON BEHALF OF STARWOOD SOLAR I, L.L.C.

STW-022

Q. Please state your name and professional background.

A. My name is Jennifer Frownfelter; I am an employee of URS Corporation. I have two master's degrees from Duke University, one in environmental management, a second in public policy. I have a bachelor's degree in biological and environmental studies from University of Colorado. My professional experience includes 10 years of environmental planning and conducting environmental impact assessments, including facility siting. Exhibit STW-023 is a copy of my professional resume.

Q. What is your current position?

A. I'm currently the manager of the environmental planning and assessment division of URS's Phoenix office.

Q. And what has been your specific experience in electrical infrastructure siting?

A. My electrical infrastructure siting and permitting experience includes this project, which I have been serving as the project manager for the preparation of the Certificate of Environmental Compatibility (CEC) application. I served as the project manager for the APS TS-5 to TS-9 500/230kV transmission line project, Case 138 and I testified before this Committee for that project. I was the assistant project manager and principal investigator for the land use studies on the West Valley/South 230 and 69kV power line and substation project, Case 122. I assisted with the agency coordination and resource studies on the La Paz generating facility project, Case 116. I was the project manager for the Northeast Valley substation and 69kV power line project. I was the assistant project manager and principal investigator for land use on Wickenburg 69kV power line project. And I was the principal investigator for

land use studies on the Big Sandy energy project EIS for which URS was a third-party contractor for the BLM.

Q. What is the scope of the engagement and your role with respect to the project that is presented in this application?

A. The scope of URS's task was to prepare an application for a CEC by conducting the environmental analyses necessary for the application. URS also facilitated a public involvement process, to solicit input from stakeholders and public agencies, to identify any issues that needed to be addressed in further detail in the environmental analyses. I am the project manager for URS responsible for completing the CEC application and its associated public involvement process.

In addition, URS has been conducting additional permitting efforts for Starwood Solar I, including a Comprehensive Plan Amendment and Special Use Permit with Maricopa County, an Air Permit with the Maricopa County Air Quality Department, an Aquifer Protection Permit with Arizona Department of Environmental Quality, and some supporting drainage design, well sampling, and geotechnical investigations.

Q. Please describe the public process conducted to support the CEC Application.

A. URS, together with representatives of Starwood and Lockheed Martin, conducted a comprehensive public involvement process that included briefings with elected officials; meetings with federal, state, county, and tribal agency staff; letters and newsletters; a website; email exchanges; and an open house.

Q. Please describe the meetings with elected officials or their staff and representatives of the various agencies and/or jurisdictions.

A. More than 20 briefings or meetings took place between May and August 2009. Depending on the meeting attendees, representatives of Starwood or Lockheed Martin presented information on the project description, preliminary transmission alternatives, construction schedule, economic development and job opportunities, permitting requirements, and responded to questions. Meetings were held with the following:

Arizona Representative Lucy Mason
Maricopa County Supervisor Mary Rose Wilcox
Maricopa County Chiefs of Staff to County Supervisors
Town of Buckeye Mayor Jackie Meck

Luke Air Force Base
Four Southern Tribes Cultural Resource Working Group

Arizona Department of Commerce
Arizona State Land Department
Arizona Department of Revenue

Flood Control District of Maricopa County
Maricopa County Planning and Development Department
Maricopa County Department of Transportation

Arlington Elementary School District
Harquahala Valley Fire District
Harquahala Valley Irrigation District
Maricopa Workforce Connections
City of Goodyear, Economic Development
City of Phoenix

Q. Please describe the letters and newsletters.

A. Letters announcing the proposed project were sent to federal, tribal, state, and county agencies. The letters included a fact sheet about the project, requested input from the agency or tribe, and offered a meeting with representatives of Starwood to provide more information about the project. Copies of the letters are provided in Exhibit J of the Application.

Two project newsletters were sent to almost 800 addresses. The mailing list included 52 agencies, 20 elected officials, 545 property owners (including all property owners within 2 miles of the solar facility site and transmission line alternatives) and any interested party who asked to be on the mailing list. The first newsletter was mailed in early July 2009; it provided general information about the project and announced the public open house held in late July. The second newsletter was mailed in early October 2009 and included an announcement of the hearings on the CEC Application. A copy of the first newsletter is provided in Exhibit J of the Application. A copy of the second newsletter is included as STW-024.

Q. Please describe the website.

A. The website, www.starwoodsolar.com, went live in July 2009 and contains information about the project, which has been updated over time. Information presented on the website has included the newsletters, a project overview, displays presented at the open house, frequently asked questions, and a website comment form that interested parties or potential contractors can fill out and/or be included on the mailing list for upcoming announcements. The CEC application also is available on the website.

Q. Please describe the telephone calls and email exchanges.

A. When individuals submitted questions or comments via the website or telephone line, URS responded to these messages by e-mail or phone. Most questions or comments came from interested contractors or materials suppliers who wanted to provide information on their services and/or products or to inquire about the bidding process. URS responded to contractor-related messages with a general email indicating they had been added to the project

mailing list. URS staff also provided information regarding the scheduled open house, that Lockheed Martin was planning to host an "industry day" in the future (prior to solicitation processes), and the anticipated schedule included the solicitation processes beginning in March 2010. Information provided from contractors was forwarded from URS to Starwood and Lockheed Martin. To-date, 167 contractors have provided information via the website or telephone line.

Similar inquiries were received from individuals interested in employment opportunities. Some individuals requested specific information on the types of jobs that would be available or the training that would be required. URS provided general information, noting that jobs would be available in the construction, engineering, and administrative fields through various contractors who would be selected to work on the project. Of the 65 public comments recorded for the project, 22 of the comments were related to employment opportunities.

Of the other 43 public comments received, they generally can be categorized as follows:

- 12 individuals asked about property values (or inquired about the opportunity to sell property)
- 11 individuals requested to speak with someone about the project
- 4 individuals inquired about water use and conservation
- 4 individuals requested being added to the mailing list
- 3 individuals expressed general support for the project
- 1 individual indicated the project would create dust
- 1 individual expressed concern for biological resources

- 7 comments were general in nature (e.g., when is the open house)

Q. Please describe the open house.

A. Starwood hosted a public open house on July 30, 2009 in Tonopah, Arizona. Approximately 80 people attended the public open house to learn more about the project and speak to project members. Representatives of Starwood and URS were present to discuss the project, environmental studies, and the status of permitting efforts. Copies of the open house presentation boards are provided in Exhibit J of the application. A large proportion of the attendees were contractors or individuals seeking work or employment opportunities. Local residents also attended and asked questions.

Q. Please describe the analyses conducted for the CEC Application.

A. Per Arizona Revised Statutes 40-360.06, URS evaluated existing and future land use plans, biological resources including plants and wildlife, cultural resources, scenic areas, recreational use, and noise. In addition to those resources, URS evaluated potential impacts on air quality and water resources, primarily groundwater, as part of the total environment affected by the project.

Q. Before describing technical studies and impact analyses, please provide an overview of the project location.

A. The project will be located in western Maricopa County, approximately 75 miles west of Phoenix, just south of Interstate 10. The project location is shown on Exhibit STW-025. The site is located approximately 20 miles west of the incorporated limits of the Town of Buckeye, and about 10 miles west of the unincorporated Town of Tonopah.

A. Exhibit STW-026 shows that the land where the solar facility will be located is privately owned. The surrounding area includes County-owned land managed by the Flood Control District of Maricopa County, State Trust Land administered by the Arizona State Land Department (ASLD), and federally owned land administered by the Bureau of Land Management (BLM). The transmission lines proposed as part of this project would be on primarily private land with a crossing of the County-owned land associated with the Saddleback Flood Retarding Structure.

Q. Please describe the existing land use in the study area.

A. Existing land use, shown on Exhibit STW-027, consists predominantly of agricultural uses and undeveloped lands. Industrial use in the area includes the Harquahala Generating Station. There are low-density residential land uses, including nine sparsely populated or unpopulated subdivisions – many of these subdivisions were approved long ago, but never developed. Along the transmission line alternatives, a majority of the land has not been cultivated, instead it's vacant/undeveloped land.

Q. How many houses are in the vicinity of the project?

A. There are three houses located in the platted subdivisions immediately to the east of the solar facility site; these three houses are within approximately 0.5 mile of the solar facility site. The locations of the houses are shown on an aerial photograph, which is Exhibit STW-028 and photographs of each of the houses is provided in Exhibits STW-029, STW-030, and STW-031. The closest house, denoted with a "1" on Exhibit STW-028, is located approximately 300 feet east of the Starwood Solar I property line. The owners of this property

attended our public open house and asked questions about the solar facility, including what it would look like from their property. The other two residences are just over 0.5 mile away. The home denoted with a "2" on Exhibit STW-028 includes several structures and appears occupied. However, it is unclear whether the residence denoted with a "3" on Exhibit STW-028 is occupied; during a recent visit to the study area the stairs to the front door had been knocked down.

There are no additional homes located within one mile of the solar facility site, and only one additional home within one mile of the Preferred Route (and alternative route 1) for the transmission line; this house is located north of Salome Highway, just east of 475th Avenue.

Q. Please describe the future land use in the study area.

A. Future land use in the area is expected to remain similar to existing land use, consistent with the Maricopa County Comprehensive Plan, which calls for rural residential uses, which would include continued agricultural uses. Future land uses are shown on Exhibit STW-032. There are 11 approved residential developments in the study area; however, approval of these developments occurred between 12 to 50 years ago, and almost no development has occurred, nor has Maricopa County received any indication that any development will occur in the near future. In addition to the approved subdivisions, another solar generating facility, Harquahala 160, which proposes to use photovoltaic technology, is planned on approximately 160 acres, northwest of the Starwood project site. Aside from the approved subdivisions and the proposed solar facility, no other specific future residential, commercial,

recreational, or other development plans were identified within or near the study area.

The Preferred Route for the transmission line to Delany would cross areas that are presently undeveloped, but along Salome Highway, the Preferred Route, would cross an approved subdivision named West Valley Ranches. West Valley Ranches was approved in 1994, but no development has occurred within that area. West Valley Ranches also is split already by the existing Salome Highway, which has a dedicated easement through that property. The Preferred Route would parallel Salome Highway through this planned future development. In comparison, Alternative Route 1 and Alternative Route 2 would include the potential to cross West Valley Ranches along either its northern or southern boundary, respectively.

Q. Overall, what are your conclusions regarding the effect of the solar generating facility on existing and future land uses in the study area?

A. The existing and planned land uses would change from agricultural uses to industrial use within a very sparsely populated area where limited development is anticipated. There would be no displacement of existing residences as a result of the project. Existing agricultural, residential, industrial and recreational uses on surrounding land would not change or be directly impacted as a result of the proposed project. The project would be consistent with plans for the area.

Q. *Please describe the impacts on biological resources in the project area.*

A. For biological resources, URS looked at special status species as well as vegetation and habitat. For special status species, URS biologists reviewed 66 special status species, and identified that seven of those species have potential to occur in the area. Species that could occur in proximity to the project site include Sonoran desert tortoise, western burrowing owl, and five species of bats. None of these species are federally listed as threatened or endangered. Sonoran desert tortoise and western burrowing owl could inhabit the areas possibly disturbed by the project, while the bats would only forage in the areas that could be disturbed. Sonoran desert tortoise would be most likely to occur in native desertscrub areas, particularly those near the site of the future Delany substation. Burrowing owl could occur in agricultural areas, as well as desertscrub areas. Development of the solar facility and associated transmission lines would degrade some habitat areas for these species, but is not anticipated to result in a reduction of habitat quantity or quality such that the status of these species is affected (i.e., a species of concern becomes listed as threatened under the Endangered Species Act). In addition, mitigation such as species surveys, and relocation if necessary, could minimize the potential for mortality of individuals during construction.

Q. What coordination with Arizona Game and Fish Department (AGFD) occurred?

A. URS biologists corresponded with AGFD, and considered input of AGFD in the analysis and in development of mitigation measures. Correspondence with AGFD is provided in Exhibit J of the Application.

Q. Please describe the impacts on cultural resources in the project area.

A. A records review documented that no archaeological or historical sites had been recorded within the solar facility site. The records review compiled information about 31 prior cultural resource studies that had been conducted since the mid-1970s within 2 miles of the solar facility site. Those studies resulted in the recording of 12 prehistoric archaeological sites, 9 historical (twentieth-century) sites, and 2 historical roads. Those resources were mostly scatters of artifacts that were confined primarily to the surface of the ground or only shallowly buried. If any of those types of sites had been present within the solar facility site, they would have been destroyed by decades of intensive farming. Therefore, the solar facility site was not intensively surveyed for cultural resources.

Through review of County Assessor records and aerial photographs and a reconnaissance survey, URS identified three previously unrecorded properties with historic-age buildings in the solar facility site. Eleven other unrecorded properties with historic-age buildings were identified within 2 miles. Those 14 properties are mostly farm headquarters and residences built between the mid-1940s and mid-1960s, and all were evaluated as lacking historic values worthy of preservation.

Three of the previously recorded archaeological sites are located along the Preferred Route to the Delany Substation (Indian School Road and Buckeye-Salome Road route) as well as the Alternative Route 1 (Indian School Road and 459th Avenue). Those sites were recorded in the mid-1970s when the Saddleback Flood Retarding Structure was being planned. The sites were described as a small scatter of prehistoric artifacts, a scatter of historic-age

trash with Ramada foundations, and another scatter of historic-age trash with remnants of a saguaro rib structure. If the sites remain intact, direct impacts might be avoided by spanning the sites. The Preferred Route and Alternative Route 1 for the transmission line also cross or parallel the historic-age Buckeye-Salome Road and Indian School Road, but those roads have been evaluated as ineligible for the Arizona Register of Historic Places. No archaeological sites have been recorded along Alternative Route 2 (along the half-section), but it has not been surveyed for cultural resources.

Q. What coordination with the State Historic Preservation Office (SHPO) occurred?

A. When preparation of the CEC application was initiated, URS notified SHPO of the project and solicited SHPO's advice regarding identification of potentially interested parties and development of an appropriate study strategy. SHPO agreed that intensive pedestrian survey of the fields within the solar facility was not warranted. The cultural resource report prepared for the project was submitted to SHPO, who concurred with the determination that the historic-age buildings in the solar facility site were not eligible for the Arizona Register of Historic Places. SHPO recommended that if a CEC is issued and once a route is approved for the transmission line to the Delany Substation, that it be surveyed for cultural resources because it crosses undeveloped land. URS understands that Starwood is prepared to implement that recommendation and work to avoid, reduce, or mitigate any impacts on significant archaeological or historical resources that might be identified. Copies of correspondence with SHPO are provided in Exhibit J of the Application. The most recent letter received from SHPO is included as Exhibit STW-033.

Q. Were tribes contacted?

A. Yes, letters were sent to 10 tribes with potential traditional cultural affiliation with the project area. The letters provided information about the project and solicited comments. Additional information was provided to some tribes in response to their questions and comments, and a presentation was made in August to the Cultural Resources Working Group of the Four Southern Tribes. A copy of the cultural resources report prepared for the project was sent to the nine tribes that indicated they had an interest in the project. Copies of correspondence with tribes are provided in Exhibit J of the Application. Recent correspondence received (after filing the Application) is included in Exhibit STW-033.

Q. Please describe the analysis of impacts on scenic resources.

A. For visual resources, URS looked at impacts on scenic quality and impacts on sensitive viewers. The project is not located within or near any designated or protected area for scenic resources. The study area includes previously disturbed landscapes, agricultural fields, which have limited variation in form, line, color, or texture in the context of the surrounding region. Additionally, the project would be adjacent to a dominant industrial structure – Harquahala Generating Station. Therefore, impacts on scenic quality would be minimal. Regarding impacts on sensitive viewers, the closest sensitive viewers are the three residences located within approximately 0.5 mile to the east of the solar facility site, which denote two of the three viewpoint locations used for photographic simulations, as shown on Exhibit STW-034. The solar facility and associated transmission line would create a moderate to strong visual contrast in the landscape when compared to the existing viewing conditions from the nearest residence. A photographic simulation of what the facility could look

like from the nearest residence along 491st Avenue is shown on Exhibit STW-035. A photographic simulation from the residences approximately 0.5 mile away is shown on Exhibit STW-036. The third photographic simulation, Exhibit STW-037, shows how the facility could from approximately 1.0 mile southeast of the project site, from Rose View Estates. As shown by the simulation, the low-profile nature of a majority of the solar facility features limits its visibility and the Starwood Solar I project would not create as much contrast or impact on views from the second and third viewpoint locations.

Q. Please describe the impacts on recreation resources.

A. The solar facility site and transmission line routes do not include designated recreational areas. No impacts on recreational opportunities in the area are anticipated.

Q. Please describe the noise anticipated from the project.

A. URS measured ambient noise in the project area at various points around the solar facility site and modeled conditions based on the equipment that would be used for operation of the solar facility. As a result, predicted operational noise levels at noise-sensitive receivers would increase only a barely perceptible amount over existing levels. One exception was noted at a location immediately adjacent to the power block area of the solar facility site; however, no existing residences (noise-sensitive receivers) are located in this area. Additional noise would be generated during construction activities, but these impacts would be temporary and intermittent over the period of construction.

Q. Are there other factors that URS evaluated as part of the total environment?

A. Yes. URS evaluated the potential for impacts on air quality and groundwater resources. For air quality, URS conducted a preliminary evaluation of the emissions associated with construction and operation of the solar generating facility and determined that the project would be subject to permitting with the Maricopa County Air Quality Department (MCAQD). Though facility design is not complete, estimates of emissions modeled for the equipment expected at the solar generating facility combined with a review of the ambient air quality conditions indicate that the project would not exceed the National Ambient Air Quality Standards. Starwood would complete necessary permitting with MCAQD prior to initiating construction of the solar facility. For groundwater, Mr. Richard Henry will testify regarding the project impacts.

Q. Please describe the overall impacts for the transmission line alternatives to the Delany substation.

A. Though there are small differences among the Preferred Route, Alternative Route 1, and Alternative Route 2, the differences in potential environmental impacts is negligible; each of the alternatives is environmentally compatible. With respect to land uses, a majority of the transmission line alignment, regardless of the alternative, was identified to follow major linear features such as roads or section lines and/or property boundaries to minimize potential impacts. Though the transmission line crosses a planned development, it would follow Salome Highway where right-of-way for the highway has been dedicated already. Therefore, the Preferred Route would not conflict with any plans for the area. With respect to biological resources, the

length of line crossing previously undisturbed areas varies slightly by alternative, but pre-construction surveys would minimize any potential difference in impacts – which would be similar to those described previously for biological resources. Similarly, for cultural resources, a pedestrian survey of the final right-of-way would be anticipated regardless of the alternative, as a way to avoid sensitive archaeological resources.

Q. Why was the Preferred Route selected?

A. The Preferred Route is shorter, would cost less, follows existing linear features or section lines along its entirety, and would not have any greater impact on natural and cultural resources than other alternatives.

Q. What other permits are necessary for Starwood Solar I?

A. Starwood Solar I will require numerous permits, including the CEC. Starwood has applied for a Comprehensive Plan Amendment and Special Use Permit from Maricopa County, which is required for changing the land use and zoning of the site. Starwood also will pursue an air permit from MCAQD for operation of the solar facility, and an Aquifer Protection Permit (APP) from Arizona Department of Environmental Quality for the development and operation of the process wastewater impoundments. Other permits will be acquired as necessary, for construction or operational activities such as dust control, stormwater management, operation of a public water supply, and heavy-haul of equipment to the site on Arizona highways.

Q. Overall, what is your assessment of the Starwood Solar I project?

A. Based on a review of the environmental factors in A.R.S. 40-360.06, the project, including the solar facility and associated transmission line, is environmentally compatible.

Q. I have no further questions.

###

BEFORE THE ARIZONA POWER PLANT

AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF STARWOOD SOLAR I, L.L.C., IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES, SECTIONS 40-360, et seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF A 290 TO 365 MEGAWATT SOLAR THERMAL POWER PROJECT AND A 500KV TRANSMISSION LINE ORIGINATING AT THE PLANNED STARWOOD SOLAR I SUBSTATION TO THE PLANNED AND PERMITTED DELANY SUBSTATION AND INCLUDING A 500KV TRANSMISSION LINE FROM THE PROPOSED STARWOOD SOLAR I SUBSTATION TO THE EXISTING HARQUAHALA GENERATING STATION SWITCHYARD IN MARICOPA COUNTY, ARIZONA.	Docket No. L-00000MM-09-0446-00150 Case No. 150

DIRECT TESTIMONY OF RICHARD HENRY

ON BEHALF OF STARWOOD SOLAR I, L.L.C.

STW-038

Q. Please state your name and professional background.

A. My name is Richard Henry, P.G.; I am currently an employee of URS Corporation. I have Bachelor and Master of Science degrees from the University of Georgia in Geology and I am currently a Doctor of Philosophy candidate in Geochemistry at the Colorado School of Mines. I have 31 years experience as a professional geologist, and 24 years experience as a professional hydrogeologist and environmental consultant. Exhibit STW-039 is a copy of my professional resume.

Q. Please summarize your conclusions regarding the matters addressed in your testimony.

A. URS reviewed historical data and analyses, and modeled groundwater use at the proposed Starwood Solar I facility site, and determined that groundwater will provide adequate water supply for the project based on a maximum groundwater pumpage of 3,000 acre-feet/year for the 30-year operational life of the facility without measurably impacting groundwater resources beyond what is allowed by statute and currently occurs under agricultural use.

Q. Please briefly describe the studies and analyses that you performed regarding the water resources.

A. URS reviewed historical water use, water quality, and subsidence data and groundwater impact analyses for the proposed solar facility property and the surrounding Harquahala Basin. URS constructed a numerical groundwater flow model to simulate future groundwater conditions at the proposed Starwood Solar I site and projected potential groundwater impacts from the operation of the proposed facility for a 30-year operational life. A copy of the report is included as Exhibit STW-040.

Q. Please explain historical groundwater use patterns on the project site.

A. Considering the groundwater use information available for the Harquahala Basin (STW-041), groundwater use for agriculture began in the early 1940's and expanded during the early 1950s when groundwater pumping was less than 10,000 acre-feet per year. Groundwater use increased rapidly as agriculture increased in the basin, peaking in the early 1960s when groundwater pumping was about 200,000 acre-feet per year. Groundwater use in the basin decreased from its 1960s peak until 1986 (13,000 acre-feet) when Central Arizona Project (CAP) water became available for irrigation. Groundwater use in the basin reached a low in 1990 (1,816 acre-feet per year) and has subsequently risen to 66,183 acre-feet per year in 2008. Depths to groundwater declined about 150 feet with the increased groundwater use rates until 1986 when CAP water use increased, allowing the water levels to recover and rise about 90 feet. STW-042 compares the historical depth to water changes for a well located adjacent to the proposed solar facility property and the annual groundwater use in the Harquahala Basin.

Historical groundwater and CAP water use for the proposed solar facility property is shown on STW-043. Annual groundwater use reported for 2000 through 2008 ranged between 1,035 and 6,288 acre-feet per year and averaged 2,604 acre-feet per year. Actual groundwater use is likely under reported and may be higher than reported. Annual CAP water use reported for 2000 through 2008 ranged between 866 and 9,347 acre-feet per year and averaged 4,493 acre-feet per year. The maximum proposed groundwater use for the proposed solar facility, 3,000 acre-feet per year, is about 58 percent less than the current total agricultural water use, 7,097 acre-feet per year, at the property for 2000 to 2008. The average estimated total water use for

agriculture is about 3.7 acre-feet per acre per year, which is significantly more than the proposed solar facility, which is projected to use 1.6 acre-feet per acre per year.

Q. Please explain the projected hydrologic effects of the operation of the solar facility, assuming 3,000 acre-feet/year of groundwater use.

A. If CAP water and groundwater use is continued within the Harquahala Basin into the future at the average use rates for 2000 to 2008, and only groundwater is used to supply the water needs of the site, URS groundwater impact analyses predict that the proposed solar facility will likely have no measureable impact on groundwater levels compared to continued agricultural use. STW-044 shows the results of the model predictions for the 30-year (2014 to 2044) operational life of the solar facility compared to continued agricultural use. For the 30-year operational life of the proposed solar facility under this water use scenario, groundwater levels will continue to increase as presently observed, but at an average rate of 0.78 feet per year less compared to continued agricultural use, and will result in a 24-foot groundwater level decline.

If groundwater is the sole future water source within the Harquahala Basin and at the proposed solar facility, and the maximum proposed groundwater use rate at the proposed solar facility is 3,000 acre-feet per year, the results of URS groundwater impact analyses predict that the facility will likely have no measurable impact on groundwater levels compared to continued agricultural use. STW-045 shows the results of the model predictions for the 30-year (2014 to 2044) operational life of the solar facility compared to continued

agricultural use. For the 30-year operational life of the proposed solar facility under this water use scenario, groundwater levels will rise about 10 feet, an average increase of 0.33 feet per year, compared to continued agricultural use.

Groundwater use at the proposed Starwood Solar I facility is not expected to cause substantial impacts or discernable trends in groundwater quality relative to continued agricultural use because aquifer groundwater levels will not noticeably change as a result of solar facility pumping. Therefore, the depth from which water is pumped and the quality of water pumped should not vary from present agricultural use conditions.

Groundwater level changes resulting from groundwater pumpage at the proposed solar facility are predicted to be negligible compared to historical groundwater declines, and is significantly less than groundwater level declines that would be caused by continued agriculture or residential development on the proposed solar facility site. Thus, groundwater use at the proposed solar facility is not expected to result in a substantial change in the existing rate of subsidence during the 30-year operational life of the facility.

Q. Is the Project Site located in an Active Management Area under the Arizona Groundwater Code?

A. No. It is located in an Irrigation Non-Expansion Area (INA).

Q. What are the requirements of an INA, with respect to use of groundwater?

A. Pursuant to Arizona Revised Statutes § 45-440, there are limitations on the use of groundwater in an INA. Withdrawal of more than one hundred acre-feet of groundwater per year for commercial or industrial purposes is permitted only if the groundwater is withdrawn as follows:

1. From land that is eligible to be irrigated pursuant to ARS §45-437, Subsection B.
2. From a depth to 1,000 feet at the site or sites of the proposed withdrawals.
3. At a rate that when added to the existing rate of withdrawals in the area does not cause the groundwater table at the site or sites of the withdrawals to decline more than ten feet per year.
4. In an amount per acre of land from which withdrawals are made that does not exceed:
    a) Six acre-feet in any year.
    b) Thirty acre-feet for any period of ten consecutive years computed in continuing progressive series beginning in the year that withdrawals begin.

Q. Will the project meet the requirements for groundwater use in the Harquahala INA?

A. Yes, it will.

The proposed Starwood Solar I facility pumpage will meet all requirements for withdrawal of more than one hundred acre-feet of groundwater per year for commercial or industrial purposes in an INA as described in ARS § 45-440.

1. Groundwater will be withdrawn and used on land eligible to be irrigated with historical Irrigation Authorities assigned to the property.
2. Using only groundwater to supply the proposed solar facility water needs, model simulation predicts that the projected depth to groundwater beneath the solar facility site after 30 years of maximum pumpage of 3,000 ac-ft/yr is approximately 482 feet below land surface. The projected depth to groundwater beneath the site after 30 years of continued agricultural groundwater pumpage is approximately 492 feet below land surface. Both of these predicted depths are sufficient to allow wells to be constructed so

that groundwater is withdrawn from less than the 1,000 ft withdrawal depth specified in ARS §45-440.

3. Using only groundwater to supply the proposed solar facility water needs, the predicted annual rate of decline in groundwater level at the proposed solar facility and all other approved water users is approximately 5.2 feet per year. The predicted annual rate of decline in groundwater level for continued agricultural groundwater pumpage at the site is approximately 5.5 feet per year. Both of these predicted groundwater table decline rates are less than the 10 ft/yr groundwater table decline rate specified in ARS § 45-440.
4. The maximum groundwater pumpage of 3,000 ac-ft/yr at the proposed solar facility is approximately 1.6 ac-ft/ acre, which is 53 percent of the ten-year average limit of three ac-ft/ acre specified in ARS §45-440. This project groundwater withdrawal rate (1.6 ac-ft/acre/yr) does not exceed either the 6 ac-ft/acre in any one year or the thirty ac-ft/acre for any period of ten consecutive years specified in ARS § 45-440.

Q. Can you summarize your professional opinion regarding the adequacy of the Project Site's groundwater resources to support the proposed Project, and the effects of the Project's water use upon those groundwater resources in the future?

A. Based on the information that URS has reviewed and the analyses that URS has performed, the available groundwater at the proposed Starwood Solar I site is adequate to support the facility water demands. Groundwater use at the proposed Starwood Solar I site will be about 58 percent less than the current agricultural CAP water and groundwater use at the property and will likely have no measureable impact on groundwater levels beneath the proposed site compared to continued agricultural use.

Q. I have no further questions.

BEFORE THE ARIZONA POWER PLANT

AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF STARWOOD SOLAR I, L.L.C., IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES, SECTIONS 40-360, et seq., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF A 290 TO 365 MEGAWATT SOLAR THERMAL POWER PROJECT AND A 500KV TRANSMISSION LINE ORIGINATING AT THE PLANNED STARWOOD SOLAR I SUBSTATION TO THE PLANNED AND PERMITTED DELANY SUBSTATION AND INCLUDING A 500KV TRANSMISSION LINE FROM THE PROPOSED STARWOOD SOLAR I SUBSTATION TO THE EXISTING HARQUAHALA GENERATING STATION SWITCHYARD IN MARICOPA COUNTY, ARIZONA.	Docket No. L-00000MM-09-0446-00150 Case No. 150

DIRECT TESTIMONY OF JERRY SMITH

ON BEHALF OF STARWOOD SOLAR I, L.L.C.

STW-046

Q. Please state your name and professional affiliation.

A. My name is Jerry D. Smith. I am an Electric Utility Engineer employed by K. R. Saline and Associates, PLC ("KRSA"). My business address is 160 N. Pasadena, Mesa, AZ 85201.

Q. Please describe K.R. Saline and Associates.

A. Located in Mesa, Arizona, K.R. Saline, PLC provides electrical engineering services, management consulting, Geographic Information Systems development and support, and ongoing business operational services primarily to wholesale public electric utilities. We have performed various engineering and economic analyses for our clients and represented their interests before state and federal agencies. The firm has been involved in regional transmission, distribution, and power supply planning since 1991.

Q. Please describe your educational and professional background.

A. I graduated from the University of New Mexico in 1968 with a Bachelor of Science degree in Electrical Engineering. I received a Masters of Science degree in Electrical Engineering from New Mexico State University in 1977 majoring in power systems and electric utility management.

I am licensed with the State of Arizona as a Professional Engineer – Electrical. I have over 40 years of experience as an engineer and manager in the electric utility industry. I have served as the Transmission and Distribution Engineering Manager for KRSA since 2006.

Previously, in 1999, I was an electric engineer with the Corporation Commission Utilities Division. In that capacity, I investigated the quality of

service provided by electric utilities in Arizona and was responsible for four biennial transmission assessments regarding the reliability of existing and planned Arizona transmission facilities. I also investigated numerous system disturbances on behalf of the Corporation Commission.

I chaired a series of Commission Distributed Generation workshops in 199 and participated in the revision and application of electrical retail competition rules throughout Arizona. I have also inspected physical electric utility plant consisting of generation, transmission and distribution facilities. Such facility inspections were necessary to make a "used and useful" determination for ate case applications and to ascertain the level of security, safety, operational integrity, and maintenance exhibited by such facilities.

I was employed by the Salt River Project from 1968 through 1995. During that time I: (1) analyzed and planned transmission and distribution system improvements; (2) managed the design and consultation services required for retail customer projects; and (3) served as primary contact for local municipalities regarding siting of facilities and utilizing funds for aesthetic treatment of water and power facilities. A copy of my resume is Exhibit STW-047.

Q. What is K.R. Saline's scope of work with the Starwood Solar I project?

A. K.R. Saline is contracted to do the transmission studies and work that is required to interconnect the Starwood Solar I project to the transmission grid. This work involves studying the effects of the interconnection on the system, assisting Starwood Solar I and Starwood Energy in applying for an

interconnection, and acting as transmission consultant in connection with this application.

Q. And what was your involvement?

A. I have been integrally involved in all phases of the project and am qualified and authorized to speak on all phases of the K.R. Saline work.

Q. Please describe the transmission that is planned in connection with the Starwood Solar I project.

A. Please refer to exhibit STW-048. As you can see the output of the steam turbines is delivered to an on site switchyard, located in the middle of the "L" which if formed by the project lands. At the project switchyard the voltage is stepped up to 500 kV. The power will be transmitted at the 500 kV level from the on site switchyard to the APS Delany substation, a distance of approximately four miles. The Starwood Solar 500 kV line will then interconnect to the APS system.

Q. *Is there a Delany substation now?*

A. No. Delany along with transmission to connect Delany to the Palo Verde Hub and to the Sun Valley (TS5) substation was permitted in Case No. 128. But, it is not yet built. The manner in which Delany will be interconnected to the grid cannot be determined until APS has completed its interconnection process, identified the final interconnecting parties at Delany, and identified the necessary transmission configuration to accommodate such projects. It is expected APS will initially build one line to interconnect Delany to the grid for these new projects. Presently, Starwood's preference is that Delany be connected initially to the Palo Verde hub so the resource can be delivered to the market.

Q. Can this link be ready in time to interconnect the Starwood Solar I project?

A. Yes, APS has already acquired the right of way from Delany to Palo Verde. As part of the interconnection process APS has indicated it can achieve a construction schedule to accommodate the Starwood Solar I project in time for the first phase of the project to go on line in 2012. I point out that this construction may not initially include the Delany substation because it may not be needed for the Starwood Solar I project to connect to Palo Verde. Again, this all depends upon the outcome of the APS interconnection process.

Q. Can you show these interconnections graphically?

A. Yes, Exhibit STW-049 is a map showing the general Palo Verde area. The map shows the Delany substation, where the project will interconnect. As you can see, there are planned but un-built lines from Delany to Palo Verde (or Arlington) and to the Sun Valley or TS5 substations.

K.R. Saline Study Work

Q. Please describe the study work that K.R. Saline performed on this project.

A. K.R. Saline performed a comprehensive interconnection study analyzing the effect of the Starwood Solar I project as well as the effect of interconnection of other parties seeking an interconnection at Delany. This initial study was filed with the Commission on June 1, 2009 as a part of the 90 day filing for this application. Basically the study looked at power flow and transient stability, which I will discuss in more detail.

Q. You mentioned that you studied the effect of the interconnection on both the power flow and the transient stability of the system. Please first discuss the power flow study work.

A. In simple terms when we study power flow we are considering the effect of the real and reactive power delivery throughout the system. In other words, we ascertain if the transmission system can reliably handle the power transactions contemplated by an interconnection.

Q. What is a stability analysis?

A. A stability analysis considers the performance of the system during and following a system disturbance. System disturbances are classified into four different categories. Each disturbance category has its own mandatory reliability performance requirement. Stability studies are performed for proposed interconnections to demonstrate compliance with the requirements of each disturbance category.

Q. What are the conclusions of the K.R. Saline Study?

A. The K.R. Saline Study concludes that for the transmission lines currently planned and system conditions studied the Starwood Solar I project can meet all WECC/NERC power flow and transient stability performance requirements if it is the only queue generation interconnected at Delany.

Q. Is this a conclusion that you can make with respect to all of the interconnection requests that are pending for the Delany Switchyard?

A. Yes it is if all of the transmission lines originally planned at the time the study was initiated are actually constructed. However, since the study was initiated

APS has delayed its transmission lines in the area and Southern California Edison has given notice that it is withdrawing its attempts to build the segment of the Palo Verde to Devers II line traversing Arizona. Therefore, the transmission additions necessary to reliably interconnect the Delany Switchyard to the grid is dependent upon the number, size and timing of interconnecting generation projects in the APS queue.

Q. Will additional studies be required?

A. Yes, we anticipate additional studies will be necessary in order for APS to determine the final system configuration required for the project. APS will continue to perform studies for the various Delany interconnection parties according to its interconnection process until a final definitive list of interconnectors and interconnection quantities are determined. At that time, the configuration of Delany and supporting transmission lines will be determined by APS. The generic generation equipment which we studied will eventually be replaced with manufacturer and vendor specific equipment. The APS interconnection process requires that when final equipment specifications are determined, APS and the interconnection party must retest the electrical models to assure no adverse impacts are exhibited by the final equipment selection.

Q. What does this mean?

A. It means more studies must be performed, but the results of such studies cannot materially change the conclusions of what is required of this project regarding performance of the transmission grid. It means that when the APS interconnection process is concluded, APS must verify the final configuration and equipment of the interconnecting projects to assure they all perform

electrically within acceptable utility practices, otherwise such projects cannot interconnect to the APS system.

The Interconnection Work

Q. Please describe the interconnection work that has performed on this project.

A. As this project will interconnect with the transmission grid at the APS Delany substation, Starwood Solar I is currently proceeding with an interconnection request and process with APS. Because there are several other interconnection requests to Delany, APS is performing what is known as a "cluster study", which evaluates the impacts of multiple interconnections.

Q. What is the status of the interconnection request?

A. Starwood Energy filed an interconnection request for 300 MW in December, 2008. Since that time APS has been performing its studies. System Impact studies are now complete. APS is now polling the interconnectors to determine which parties will be continuing into its final study phase called Facility Studies. The Facility Studies are expected to be performed and concluded in the first quarter of 2010. At that time an interconnection agreement will be negotiated to authorize Starwood Solar I and any others to interconnect to the APS system.

Q. Do you expect any problems?

A. No, because the results of those studies must meet mandatory performance standards.

The Common Corridor Issue

Q. The Application in this case presents three alternative transmission alignments. But it does not present an alignment adjacent to the existing Harquahala 500 kV line, which is located on the Thomas Road section line. Has it been the recommendation of K.R. Saline to avoid locating next to the Harquahala line, if possible?

A. Yes. It is the recommendation of K.R. Saline to avoid if possible locating the Starwood to Delany line in a common corridor with the Harquahala to Hassayampa 500 kV transmission line.

Q. What is a common corridor?

A. The Western Electric System Coordinating Council (WECC) defines a common corridor as containing adjacent lines separated by less than 500 feet or the longest span of a line, whichever is larger. This excludes the first five spans exiting a station or switchyard.

Q. Then would the Starwood Solar I transmission line be in a common corridor if it were located on the Thomas Road section line.

A. Yes it would.

Q. What is the problem with locating multiple lines in a common corridor?

A. In April 2008 the WECC issued new criteria on requirements for transmission lines in a common corridor. These criteria state that the entire corridor must be considered a common mode outage event for transmission planning purposes. This means the outage cannot lead to the cascading outage of

other facilities and the shedding of load or tripping of generation must be planned and controlled for such an event. Thus, by locating the Starwood to Delany line in the common corridor would create a potential for dropping both the Harquahala and Starwood Solar I generators. If the combined capacity of the two plants exceeds the rating of an existing Palo Verde unit then this corridor event would become the largest single hazard in the West. As a result this common corridor arrangement would not be viewed favorably by the industry.

Q. Then I assume this result needs to be avoided?

A. *Absolutely, if at all possible.*

Q. There are other instances in Arizona where multiple 500 kV lines occupy a common corridor, what about them?

A. These other corridors are different in that they neither constitute a largest single hazard for generation nor result in system performances that would violate mandatory reliability standards.

Conclusions

Q. *Please summarize your conclusions.*

A. As discussed in this testimony, K.R. Saline concludes:

1. The Starwood Solar I project may be reliably interconnected to the transmission system at the Delany substation pending:
   a) Culmination of the APS interconnection queue process and assuming no material change in the system conditions already studied.

b) The transmission system is physically ready to accept this interconnection by the projected in service date of the first phase, 2012.

2. K.R. Saline also strongly recommends that the project avoid locating transmission in a common corridor with the Harquahala Generating Station Transmission.

Q. Does this conclude your testimony?

A. Yes.

Q. I have no further questions.

###